WIND VS COAL POWER IN THE UNITED STATES

Carbon Tracker initiative

WIND INFLECTION YEARS

YEAR when building **new wind** will cost less than **new coal**

YEAR when building **new wind** will cost less than **running coal**

GRID

YEAR

YEAR

US$/MWh
Grid avg. wind price 2019

IN THE US, ON AVERAGE:

New wind costs less than new coal

TODAY

Planned coal capacity

N/A

New wind costs less than all operating coal

TODAY

Total coal capacity

254 GW

WECC
TODAY
2037
37 US$/MWh

SPP
TODAY
TODAY
19 US$/MWh

MRO
TODAY
TODAY
21 US$/MWh

NPCC
TODAY
TODAY
59 US$/MWh

RFC
TODAY
TODAY
33 US$/MWh

FRCC
TODAY
TODAY
35 US$/MWh

SERC
TODAY
TODAY
31 US$/MWh

TRE
TODAY
TODAY
26 US$/MWh

GCPEM

COAL POWER PLANTS

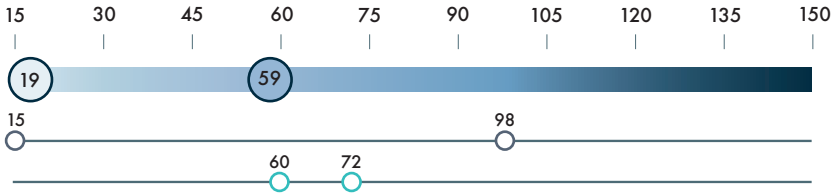
Capacity
- 1000 MW
- 2000 MW
- 3000 MW

Operating

Country Price Range 2019

US$/MWh
Low- and high-end averages

$$



Source: Carbon Tracker analysis

SOLAR PV VS COAL IN THE UNITED STATES

Carbon Tracker Initiative

SOLAR INFLECTION YEARS

YEAR when building **new solar** will cost less than **new coal**

YEAR when building **new solar** will cost less than **running coal**

GRID

YEAR

YEAR

US$/MWh
Grid avg. solar PV price 2019

IN THE US, ON AVERAGE:

New solar costs less than new coal

TODAY

Planned coal capacity

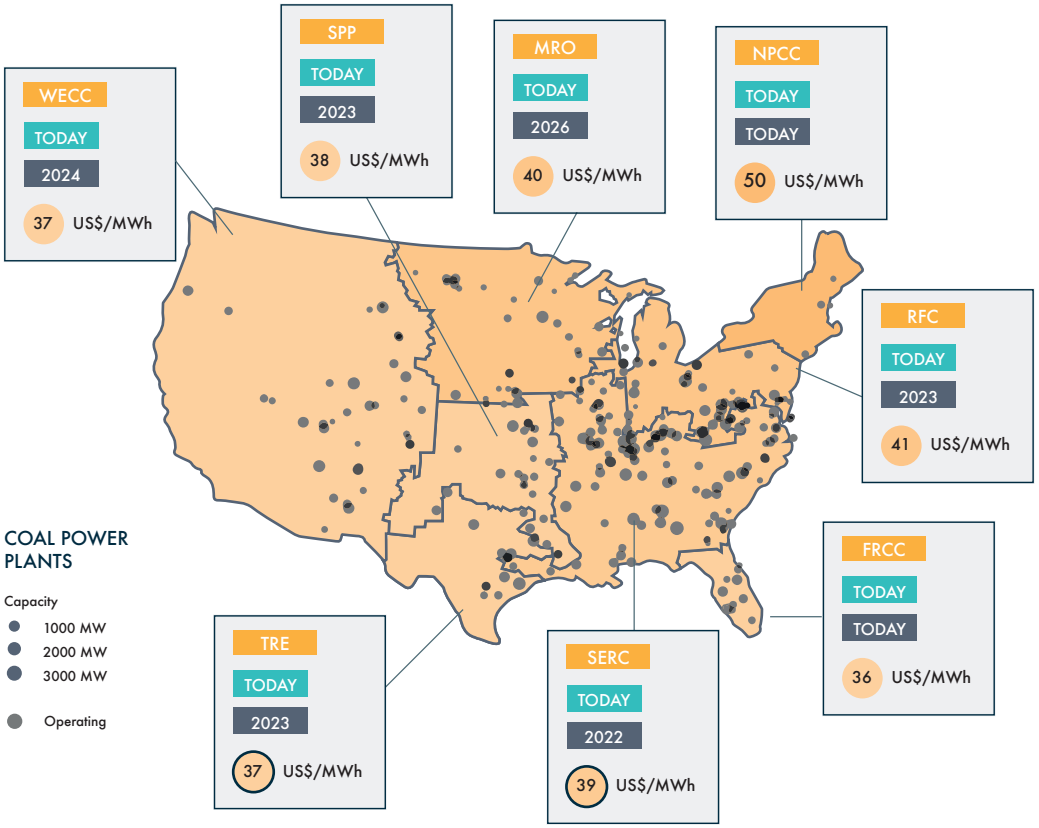
N/A

New solar costs less than all operating coal

TODAY

Total coal capacity

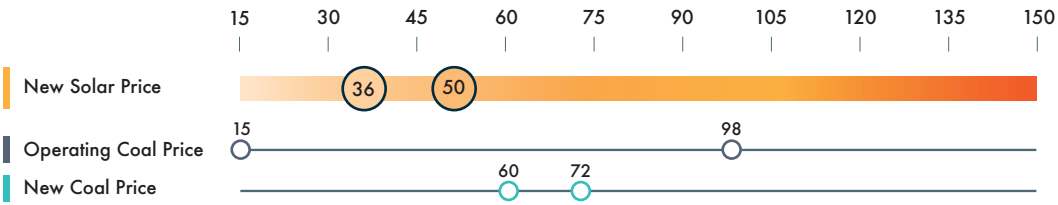
254 GW



Country Price Range 2019

US$/MWh
Low- and high-end averages

$$



Source: Carbon Tracker analysis

WIND VS COAL POWER IN CHINA

Carbon Tracker Initiative

WIND INFLECTION YEARS

YEAR — when building **new wind** will cost less than **new coal**

YEAR — when building **new wind** will cost less than **running coal**

GRID
YEAR
YEAR
US$/MWh
Grid avg. wind price 2019

IN CHINA, ON AVERAGE:

New wind costs less than new coal — TODAY

New wind costs less than all operating coal — TODAY

Planned coal capacity ● 106 GW

Total coal capacity ● 982 GW

COAL POWER PLANTS

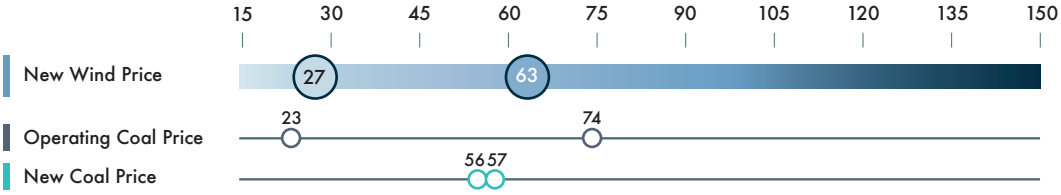
Capacity
- 2000 MW
- 4000 MW
- 6000 MW

- Operating
- Planned
- Under construction

Country Price Range 2019

US$/MWh
Low- and high-end averages

$$



Source: Carbon Tracker analysis

SOLAR PV VS COAL IN CHINA

Carbon Tracker Initiative

SOLAR INFLECTION YEARS

YEAR when building **new solar** will cost less than **new coal**

YEAR when building **new solar** will cost less than **running coal**

GRID

YEAR

YEAR

US$/MWh
Grid avg. solar PV price 2019

IN CHINA, ON AVERAGE:

New solar costs less than new coal

TODAY

Planned coal capacity

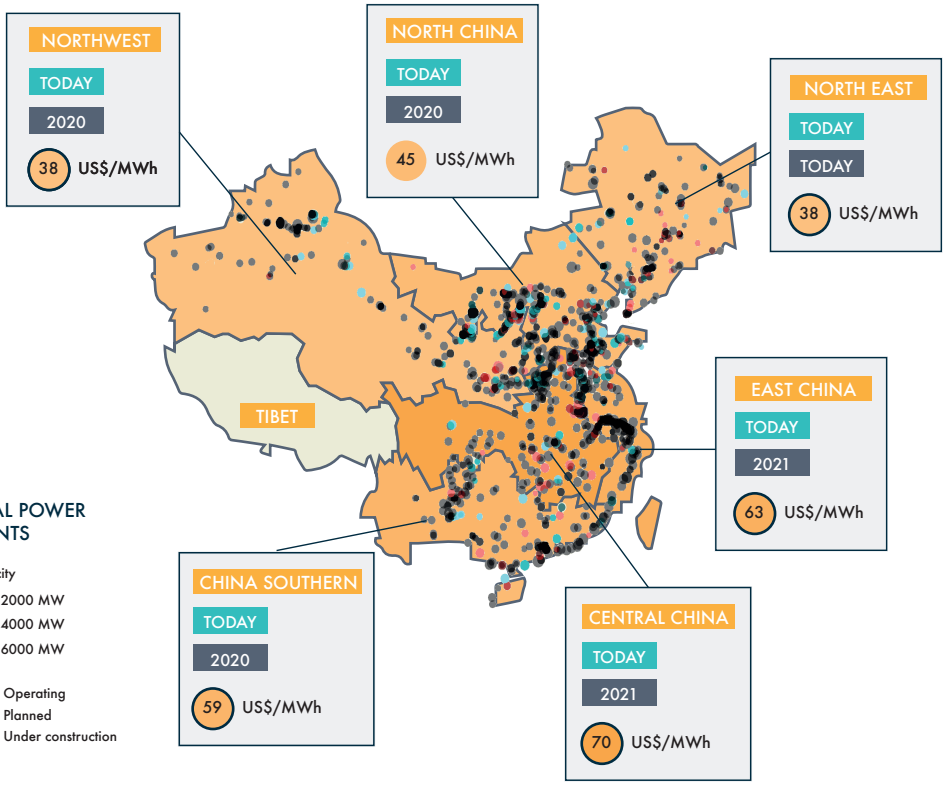
106 GW

New solar costs less than all operating coal

2020

Total coal capacity

982 GW



COAL POWER PLANTS

Capacity

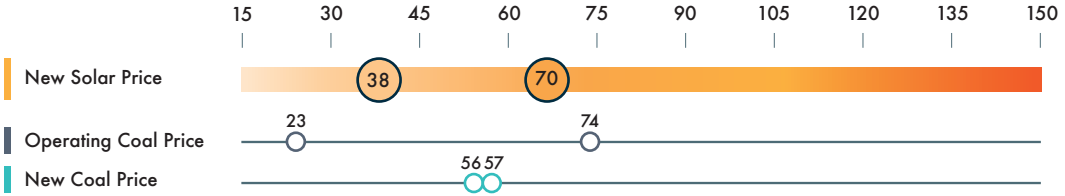
- 2000 MW
- 4000 MW
- 6000 MW

- Operating
- Planned
- Under construction

Country Price Range 2019

US$/MWh
Low- and high-end averages

$$



Source: Carbon Tracker analysis

WIND VS COAL POWER IN INDIA

Carbon Tracker

WIND INFLECTION YEARS

YEAR — when building **new wind** will cost less than **new coal**

YEAR — when building **new wind** will cost less than **running coal**

GRID
YEAR
YEAR
US$/MWh
Grid avg. wind price 2019

IN INDIA, ON AVERAGE:

New wind costs less than new coal
TODAY

New wind costs less than all operating coal
2022

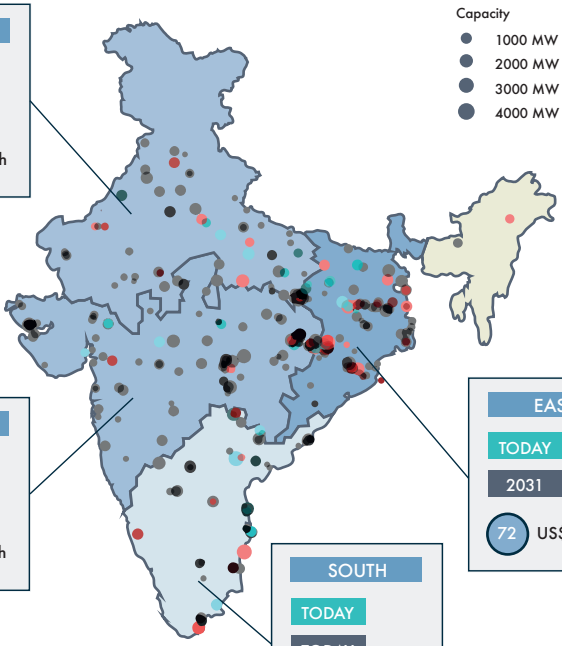
Planned coal capacity
29 GW

Total coal capacity
222 GW

COAL POWER PLANTS

Capacity
1000 MW
2000 MW
3000 MW
4000 MW

Operating
Planned
Under construction



NORTH
TODAY
TODAY
40 US$/MWh

WEST
TODAY
2020
41 US$/MWh

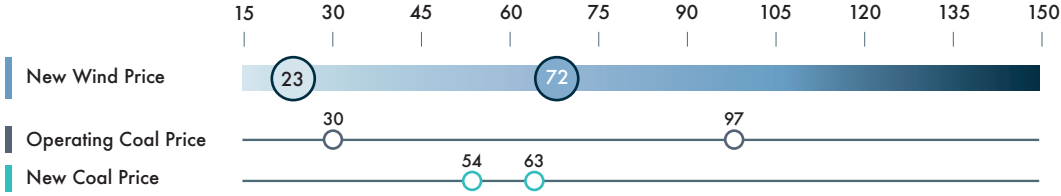
EAST
TODAY
2031
72 US$/MWh

SOUTH
TODAY
TODAY
23 US$/MWh

Country Price Range 2019

US$/MWh
Low- and high-end averages

$$



Source: Carbon Tracker analysis

SOLAR PV VS COAL IN INDIA

Carbon Tracker Initiative

SOLAR INFLECTION YEARS

YEAR — when building **new solar** will cost less than **new coal**

YEAR — when building **new solar** will cost less than **running coal**

GRID

YEAR

YEAR

US$/MWh
Grid avg. solar PV price 2019

IN INDIA, ON AVERAGE:

New solar costs less than new coal

TODAY

Planned coal capacity
29 GW

New solar costs less than all operating coal

2020

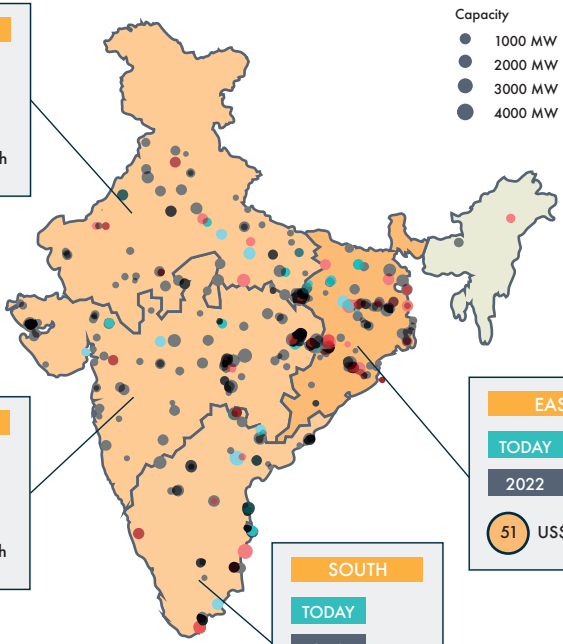
Total coal capacity
222 GW

COAL POWER PLANTS

Capacity

- 1000 MW
- 2000 MW
- 3000 MW
- 4000 MW

- Operating
- Planned
- Under construction



NORTH
TODAY
TODAY
38 US$/MWh

WEST
TODAY
TODAY
38 US$/MWh

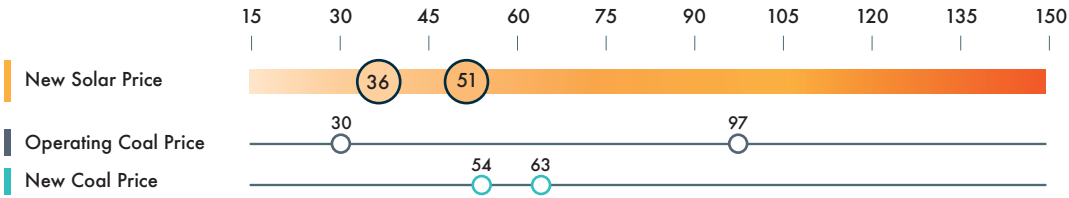
EAST
TODAY
2022
51 US$/MWh

SOUTH
TODAY
TODAY
37 US$/MWh

Country Price Range 2019

US$/MWh
Low- and high-end averages

$$



Source: Carbon Tracker analysis

WIND VS COAL POWER IN JAPAN

Carbon Tracker Initiative

WIND INFLECTION YEARS

YEAR — when building **new wind** will cost less than **new coal**

YEAR — when building **new wind** will cost less than **running coal**

GRID
YEAR
YEAR
US$/MWh
Grid avg. wind price 2019

IN JAPAN, ON AVERAGE:

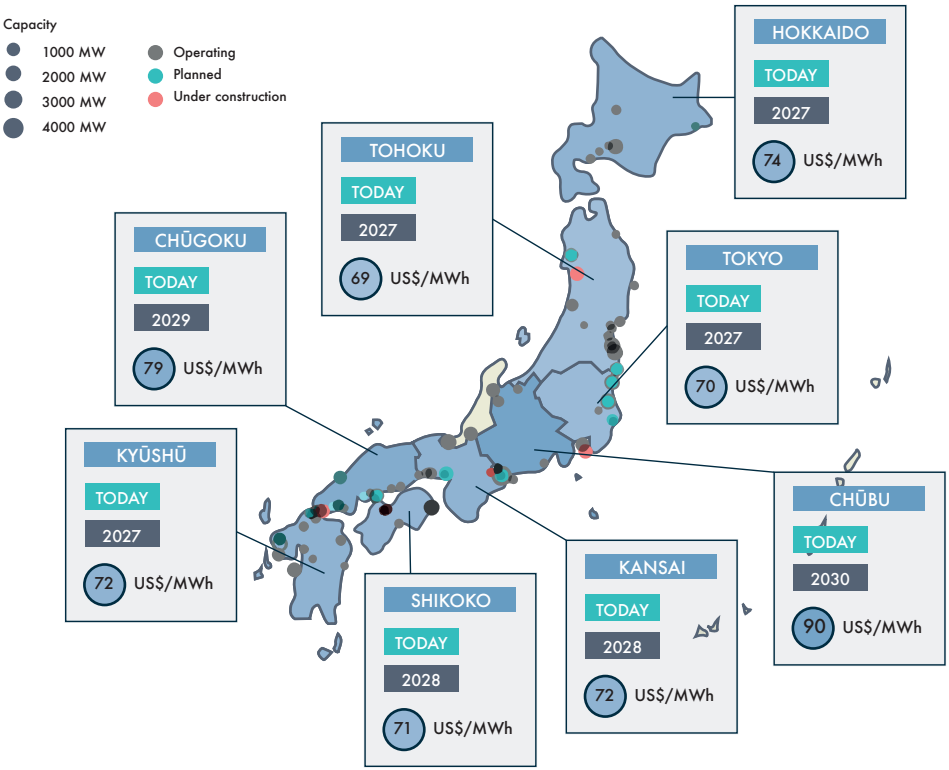
New wind costs less than new coal
TODAY

New wind costs less than all operating coal
2028

Planned coal capacity
3 GW

Total coal capacity
45 GW

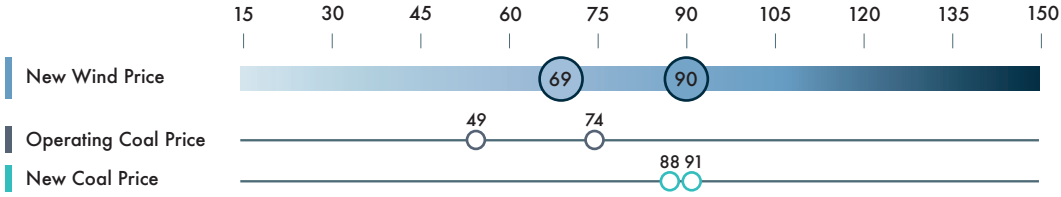
COAL POWER PLANTS



Country Price Range 2019

US$/MWh
Low- and high-end averages

$$



Source: Carbon Tracker analysis

SOLAR PV VS COAL IN JAPAN

Carbon Tracker Initiative

SOLAR INFLECTION YEARS

YEAR when building **new solar** will cost less than **new coal**

YEAR when building **new solar** will cost less than **running coal**

GRID

YEAR

YEAR

US$/MWh
Grid avg. solar PV price 2019

IN JAPAN, ON AVERAGE:

New solar costs less than new coal

2023

Planned coal capacity

3 GW

New solar costs less than all operating coal

2026

Total coal capacity

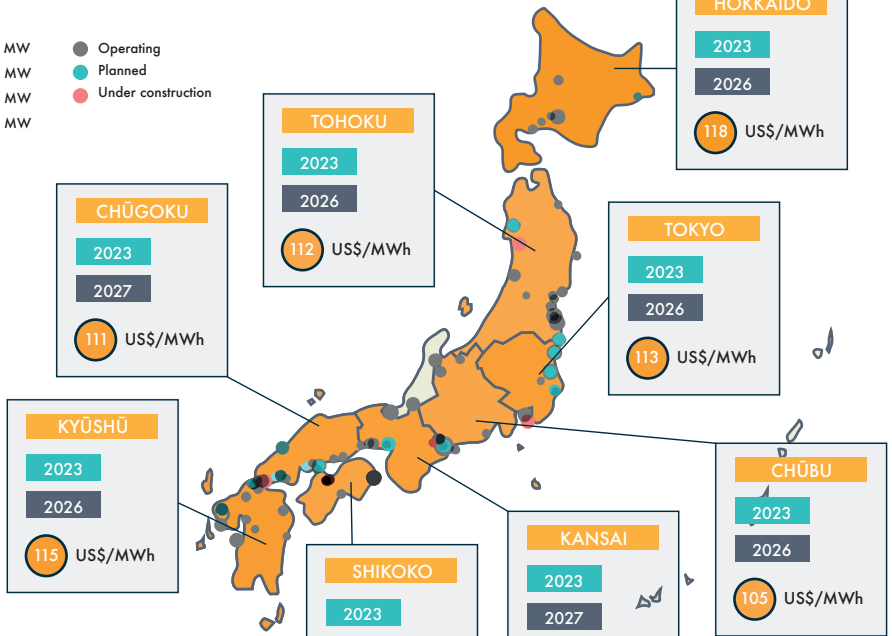
45 GW

COAL POWER PLANTS

Capacity

- 1000 MW
- 2000 MW
- 3000 MW
- 4000 MW

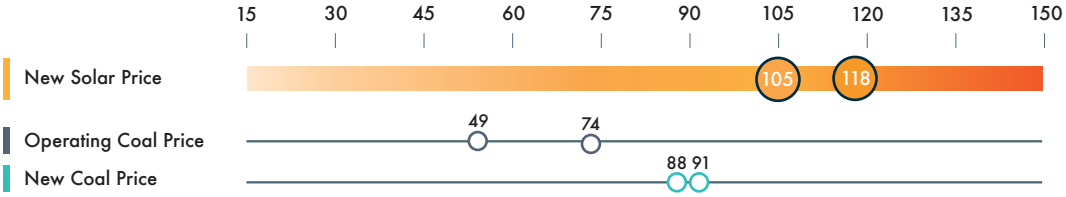
- Operating
- Planned
- Under construction



Country Price Range 2019

US$/MWh
Low- and high-end averages

$$



Source: Carbon Tracker analysis

WIND VS COAL POWER IN TURKEY

Carbon Tracker

WIND INFLECTION YEARS

YEAR — when building **new wind** will cost less than **new coal**

YEAR — when building **new wind** will cost less than **running coal**

GRID
YEAR
YEAR
US$/MWh Grid avg. wind price 2019

IN TURKEY, ON AVERAGE:

New wind costs less than new coal
TODAY

New wind costs less than all operating coal
2027

Planned coal capacity
32 GW

Total coal capacity
19 GW

COAL POWER PLANTS

Capacity
- 2000 MW
- 4000 MW
- 6000 MW

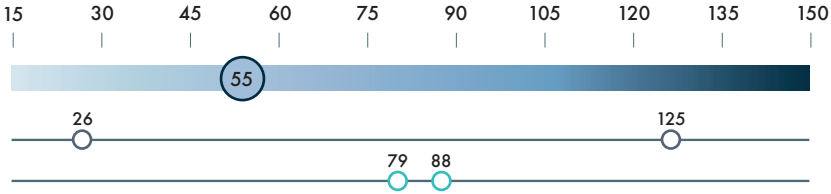
- Operating
- Planned
- Under construction

TURKEY
TODAY
2027
55 US$/MWh

Country Price Range 2019

US$/MWh
Low- and high-end averages

$$



Source: Carbon Tracker analysis

SOLAR PV VS COAL IN TURKEY

Carbon Tracker Initiative

SOLAR INFLECTION YEARS

YEAR when building **new solar** will cost less than **new coal**

YEAR when building **new solar** will cost less than **running coal**

GRID

YEAR

YEAR

US$/MWh
Grid avg. solar PV price 2019

IN TURKEY, ON AVERAGE:

New solar costs less than new coal

TODAY

Planned coal capacity

32 GW

New solar costs less than all operating coal

2023

Total coal capacity

19 GW

COAL POWER PLANTS

Capacity

- 2000 MW
- 4000 MW
- 6000 MW

- Operating
- Planned
- Under construction

TURKEY

TODAY

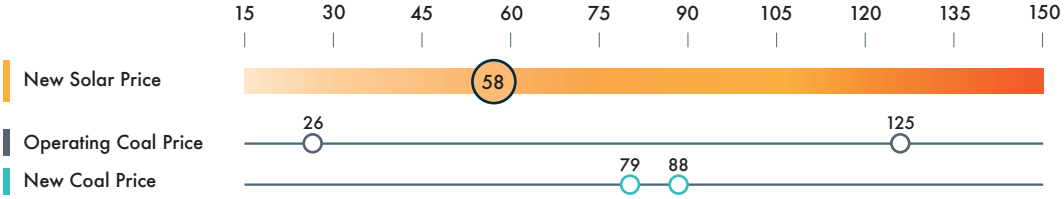
2023

58 US$/MWh

Country Price Range 2019

US$/MWh
Low- and high-end averages

$$



Source: Carbon Tracker analysis

WIND VS COAL POWER IN THE ASEAN COUNTRIES

Carbon Tracker

WIND INFLECTION YEARS

YEAR — when building **new wind** will cost less than **new coal**

YEAR — when building **new wind** will cost less than **running coal**

GRID
YEAR
YEAR
US$/MWh
Grid avg. wind price 2019

IN ASEAN, ON AVERAGE:

New wind costs less than new coal: 2020

New wind costs less than all operating coal: 2036

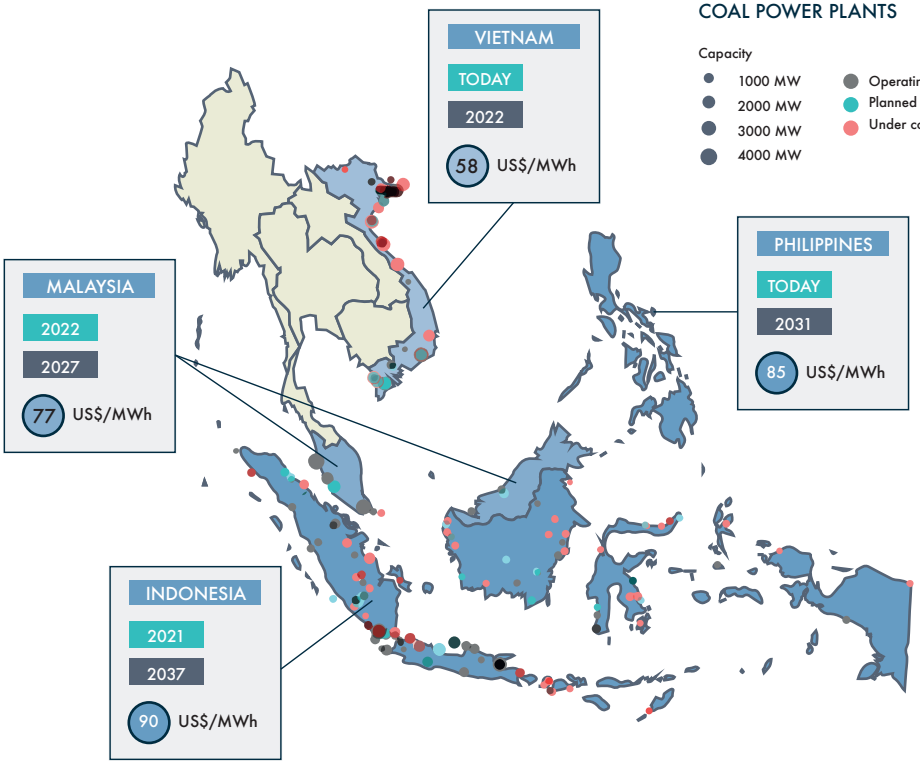
Planned coal capacity: 55 GW

Total coal capacity: 66 GW

COAL POWER PLANTS

Capacity
- 1000 MW
- 2000 MW
- 3000 MW
- 4000 MW

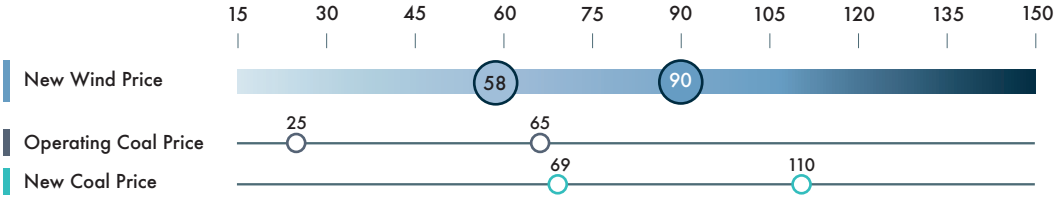
- Operating
- Planned
- Under construction



Country Price Range 2019

US$/MWh
Low- and high-end averages

$$



Source: Carbon Tracker analysis

SOLAR PV VS COAL IN THE ASEAN COUNTRIES

Carbon Tracker Initiative

SOLAR INFLECTION YEARS

YEAR when building **new solar** will cost less than **new coal**

YEAR when building **new solar** will cost less than **running coal**

GRID

YEAR

YEAR

US$/MWh
Grid avg. solar PV price 2019

IN ASEAN, ON AVERAGE:

New solar costs less than new coal

TODAY

New solar costs less than all operating coal

2027

Planned coal capacity
55 GW

Total coal capacity
66 GW

COAL POWER PLANTS

Capacity

- 1000 MW
- 2000 MW
- 3000 MW
- 4000 MW

- Operating
- Planned
- Under construction

VIETNAM
TODAY
2022
55 US$/MWh

PHILIPPINES
TODAY
2030
73 US$/MWh

MALAYSIA
TODAY
2023
75 US$/MWh

INDONESIA
TODAY
2025
70 US$/MWh

Country Price Range 2019

US$/MWh
Low- and high-end averages

$$

	15	30	45	60	75	90	105	120	135	150
New Solar Price				54	75					
Operating Coal Price		25			65					
New Coal Price					69			110		

Source: Carbon Tracker analysis

WIND VS COAL POWER IN EUROPE

Carbon Tracker

WIND INFLECTION YEARS

YEAR — when building **new wind** will cost less than **new coal**

YEAR — when building **new wind** will cost less than **running coal**

GRID
YEAR
YEAR
US$/MWh
Grid avg. wind price 2019

IN EUROPE, ON AVERAGE:

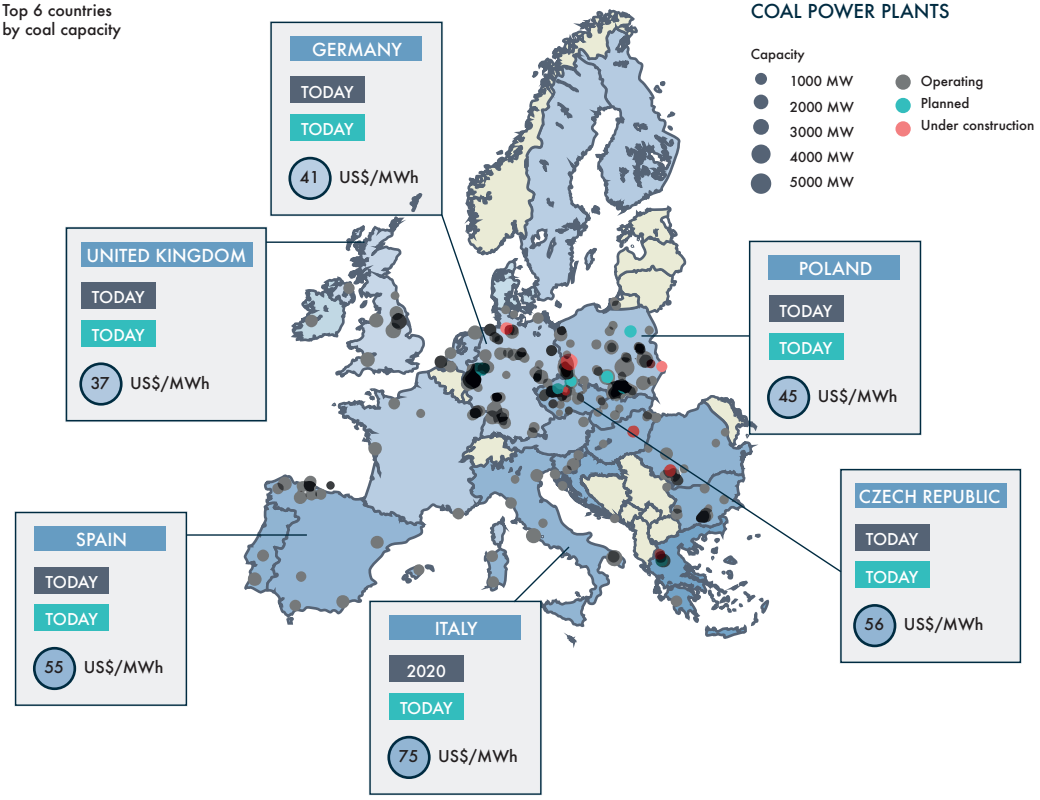
New wind costs less than new coal
TODAY

Planned coal capacity
3 GW

New wind costs less than all operating coal
TODAY

Total coal capacity
149 GW

Top 6 countries by coal capacity



COAL POWER PLANTS

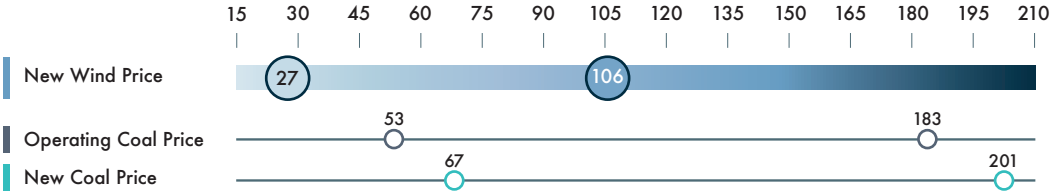
Capacity
- 1000 MW
- 2000 MW
- 3000 MW
- 4000 MW
- 5000 MW

- Operating
- Planned
- Under construction

Country Price Range 2019

US$/MWh
Low- and high-end averages

$$



Source: Carbon Tracker analysis

SOLAR PV VS COAL IN EUROPE

Carbon Tracker Initiative

SOLAR INFLECTION YEARS

YEAR when building **new solar** will cost less than **new coal**

YEAR when building **new solar** will cost less than **running coal**

GRID

YEAR

YEAR

US$/MWh
Grid avg. solar PV price 2019

IN EUROPE, ON AVERAGE:

New solar costs less than new coal

TODAY

Planned coal capacity

3 GW

New solar costs less than all operating coal

TODAY

Total coal capacity

149 GW

Top 6 countries by coal capacity

COAL POWER PLANTS

Capacity

1000 MW
2000 MW
3000 MW
4000 MW
5000 MW

Operating
Planned
Under construction

GERMANY

TODAY

TODAY

51 US$/MWh

UNITED KINGDOM

TODAY

TODAY

77 US$/MWh

POLAND

TODAY

TODAY

53 US$/MWh

SPAIN

TODAY

TODAY

26 US$/MWh

ITALY

TODAY

TODAY

32 US$/MWh

CZECH REPUBLIC

TODAY

TODAY

53 US$/MWh

Country Price Range 2019

US$/MWh
Low- and high-end averages

$$

15 30 45 60 75 90 105 120 135 150 165 180 195 210

New Solar Price: 26 – 88

Operating Coal Price: 53 – 183

New Coal Price: 67 – 201

Source: Carbon Tracker analysis